

Alternative 2 and the Proposed Action. Administrative offices are housed in existing buildings owned by EKPC on the site and are leased by KPE. Rail loading and unloading areas required for the Proposed Action would be integrated into the balance of the plant for optimal layout of the site and utilization of the process area.

3.1.3 Project Risk

The proposed Kentucky Pioneer IGCC Demonstration Project would be a demonstration of a new technology under the CCT Program. Congress directed DOE to pursue the goals of the program by means of partial funding, or cost sharing, of projects owned and controlled by non-federal government sponsors. This project was first selected in 1993, with Duke Energy as the participant in partnership with an east coast utility; however, for various reasons the siting for the project was changed to a site in Illinois. In 1999, Global Energy, Inc., approached Duke Energy and requested to take over the project. KPE, a subsidiary of Global Energy, Inc., entered into a power purchase agreement with EKPC to buy the power from the Kentucky Pioneer IGCC facility. Because the currently proposed site for the project would provide for demonstration of the BGL technology and the power purchase agreement between EKPC would allow KPE to meet their repayment agreement with DOE, the partnership was determined acceptable.

The proposed facility would be the first commercial-scale demonstration of a co-fed BGL gasifier in the United States. The gasifier units used would also be between 40 and 50 percent larger than other existing units, allowing for greater syngas and electrical output from the facility. Because it would be the first demonstration of this technology, there would be a fair amount of financial risk for KPE associated with the operation of the facility. Another major financial risk for KPE is in securing a market for the vitreous frit produced in the gasification process. In addition to the loss of income if a market for the frit is not secured, KPE would have to bear all financial costs from storing and/or landfilling the frit. Although frit produced by gasification of coal has been found not to leach, frit resulting from the co-feed of coal and RDF has not been produced and therefore no leaching data is available. If the frit from the Kentucky Pioneer IGCC Demonstration Project is found to leach, it would not be marketable and the costs to temporarily store and landfill the frit would escalate significantly. Consequently, the financial success of the project is also dependant on the frit being deemed nonhazardous.

3.2 Fuel Source

The solid fuel source for the Kentucky Pioneer IGCC Demonstration Project would be high-sulfur coal and RDF pellets. RDF pellets would be procured from an RDF pellet manufacturer. The two fuel sources would be shipped by rail directly to on-site storage. At least 50 percent of the feed would consist of high-sulfur coal from the Kentucky region during the 1-year demonstration period (Global Energy 2000b).

3.2.1 Coal

KPE intends to use high-sulfur coal as the coal fuel co-feed; it will be procured for direct delivery to the project site. Western Kentucky coal is generally considered the high-sulfur coal region; however, Eastern Kentucky may also provide high-sulfur coal supplies. Project economics would determine the supplier and the type of coal supplied (Global Energy 2000b). The facility would require approximately 2,268 metric tons (2,500 tons) per day of coal, which equates to about 25 railcars per day. Compared to conventional coal-fired electric generation technologies, this project would require less coal consumption to generate 540 MW.

3.2.2 Refuse Derived Fuel Pellets

The RDF pellets would be procured from an existing manufacturer. RDF pellets vary in size and are typically extruded into a uniform dense shape that makes them well suited to transportation and storage. Typical sizes would be small cylinders in the 1.27 centimeter (0.5 inch) by 7.62 centimeter (3 inch) range, or 3.81 centimeter (1.5 inch) square by 10.16 centimeter (4 inch) long blocks. The bulk density of RDF pellets is approximately 640 kilograms per cubic meter (40 pounds per cubic foot). By comparison, the bulk density of bituminous coal is approximately 801 kilograms per cubic meter (50 pounds per cubic foot) and a 50-50 mix of coal and RDF by weight would be equivalent to a 44-56 mix of coal and RDF by volume (Global Energy 2000b).

The Kentucky Pioneer IGCC Demonstration Project facility will convert the RDF pellet and coal feed into a syngas fuel through a chemical process conducted in a low oxygen atmosphere. The syngas fuel will then be combusted to generate the electrical output from the plant. Though the RDF pellets themselves will not be directly combusted, the facility would be regulated as a Municipal Waste Combustor under EPA guidelines established by 40 *Code of Federal Regulations* (CFR) Part 60. Chapter 6, Statutes, Regulations, Consultations, and Other Requirements, of this EIS discusses the applicability of these guidelines to the Kentucky Pioneer IGCC Demonstration Project facility.

3.2.2.1 Pellet Manufacturers

Historically, the waste-to-energy industry has used RDF pellets as a means of assuring effective co-feeding at conventional power plants. A wide variety of RDF pellet manufacturers and RDF pellet products exist. RDF pellets from sewage sludge are also produced to facilitate effective use of the energy content of this material in a generally dry form (Global Energy 2000b). KPE intends to obtain all RDF pellets from one supplier and is in the initial stages of contract negotiations with an RDF supplier located on the east coast of the United States.

3.2.2.2 Refuse Derived Fuel Pellet Production

RDF is manufactured in a process that includes controlled steps for the processing of MSW or common household waste. Initially, sorting of the MSW removes obvious large objects, also known as white goods (e.g. refrigerators). These continue on to the landfill and amount to 5 to 10 percent of the original weight of the MSW. Cans are then removed either magnetically, or for aluminum cans, by eddy current technology. Glass is removed by gravity. These are sent to recycling units and amount to a further 5 to 10 percent of the original weight. The intent of the process is to retain items with high thermal value, such as plastics and, to a lesser extent, paper. Processing methods vary, but most of the balance is then often tumbled in a long rotary drum that might be envisioned as a pressure cooker. With steam and air insertion rates used to control the temperature and moisture of the RDF product, a sterile “mulch type material” will result. Clumps of plastic are screened out for shredding or separate handling. The energy content of plastics is well suited for the gasification process. If shredded, the plastic component can be included in the RDF pellets. Otherwise, plastic material could be fed into the gasifier separately or simply recycled conventionally. Hammer mills and trundles are typically used to reduce the MSW to a small uniform size and homogeneous mixture. The sterile mulch is then formed into dense pellets by being forced through a mold at high pressures. The exact forming process is dependant upon handling considerations and the feed performance requirements of the gasification process. Being made with relatively low moisture content, RDF pellets are stable and durable. The process results in pellets with a relatively uniform size and shape and a generally uniform energy content. RDF pellets also have a relatively low ash content and good handling and storage life before use (Global Energy 2000b).

KPE requested a determination from the Kentucky Natural Resources and Environmental Protection Cabinet regarding the applicability of solid waste statutes and administrative regulations to the RDF pellets. The Kentucky Department of Environmental Protection, Division of Waste Management issued its decision in a letter dated June 27, 2002 . Based on the characterization of the process supplied by KPE and described

above, the recyclable material would be removed and the remaining material, about 70 percent paper and 10 percent plastics, would be mixed with binders and formed into pellets. In the June 27, 2002, letter, the Division of Waste Management states that the finished product would be typical for most RDFs and determines that the material would be an RDF under Kentucky statutes and administrative regulations.

Different RDF pellet manufacturing processes may result in slightly different RDF pellet compositions. The variation in RDF pellet composition due to different manufacturing processes should not be an issue for this project since KPE intends to supply all RDF pellets for this project from the same manufacturer. In the event other suppliers are used, there may be a slight change in the composition of the vitreous frit from the gasifier unit but the resulting syngas makeup should remain the same.

The Division of Waste Management also determined that the RDF is a recovered material and that the Kentucky Pioneer IGCC Demonstration Project facility would be considered a recovered material processing facility under state law. This determination means that no waste permit is needed for the gasification process and is dependent on KPE using RDF that conforms to the statutory definition of RDF established in Kentucky Revised Statutes 224.01-010(23). The Division of Waste Management has required KPE to submit a description of the selected RDF manufacturing process to the Kentucky Natural Resources and Environmental Protection Cabinet at least 30 days before beginning gasification to ensure that no changes to the RDF have been made from this determination and that the RDF meets the statutory definition.

The Division of Waste Management asserts that this determination does not release KPE from properly handling, storing, and disposing of all waste generated by the facility. As stated above, a hazardous waste determination must be conducted on the vitrified frit and other waste streams in accordance with Title 401, Kentucky Administrative Regulations, Chapters 31 and 32, specifically Chapter 32, Subpart 010, Section 2. The TCLP for metals would be administered to the first batch of frit from the facility to determine if it were hazardous.

3.2.2.3 Refuse Derived Fuel Transport

RDF pellets are a high density, stable product of uniform size. The pellets are amenable to bulk handling and shipping without undue fragmentation and loss. Large volume shipping would most likely use inter-modal rail (Global Energy 2000b). Should negotiations prove successful with the intended supplier, the RDF pellets would be shipped from a manufacturer on the east coast of the United States. The estimated transit distance is 1,609 to 1,931 rail kilometers (1,000 to 1,200 rail miles). The facility would require about 2,500 TPD of RDF, which equates to approximately 25 rail cars per day. For planning purposes, KPE assumes unit train handling of the RDF pellets. One unit train consists of 100 rail cars. This results in approximately two unit trains of RDF pellets per week of operation and approximately 100 unit trains of RDF pellets for the complete 1-year demonstration period of the project.

3.2.3 Synthesis Gas

Section 3.1.2 details the production of syngas in the Kentucky Pioneer IGCC Demonstration Project facility. Gasification technology is known to produce a very consistent syngas product, regardless of the variability of the feed. Though the RDF pellet composition is expected to be relatively constant, slight variations in the composition would have no effect on the composition of the syngas produced. The resulting syngas is expected to be 55 percent CO, 30 percent H₂, 10 percent CO₂, 5 percent methane and ethane, with a relatively small amount of sulfur in the form of H₂S.

3.3 Fuel Source Considered But Eliminated

The following fuel source was considered in the process of identifying the Proposed Action, but was found not to be a reasonable option because it poses significant disadvantages relative to the Proposed Action and no compensating advantages.

3.3.1 Briquette Facility

The *Notice of Intent to Prepare an Environmental Impact Statement for the Kentucky Pioneer Integrated Gasification Combined Cycle Demonstration Project, Trapp, KY*, published in the *Federal Register* on April 14, 2000, indicated that a fuel production facility would provide the project with fuel briquettes made from high-sulfur coal and solid renewable fuels such as MSW. The briquette facility would have been built at an off-site location and the briquettes would have been shipped by rail to on-site storage for use as a fuel source. Since the publication of the Notice of Intent, KPE has determined that using briquettes produced from a mixture of coal and MSW is not a practical alternative. Rather, KPE proposes co-feeding coal and commercially obtained RDF pellets.

In comparison with a briquette facility, co-feeding coal and RDF pellets would provide the following advantages to the Kentucky Pioneer IGCC Demonstration Project:

- RDF pellets reduce capital and operating costs.
- RDF pellets significantly reduce transportation costs.
- RDF pellets have undergone extensive processing and are generally more innocuous than raw MSW.

3.4 Alternatives Analyzed

NEPA requires that agencies evaluate the reasonable alternatives to the Proposed Action in an EIS. The purpose for agency action determines the range of reasonable alternatives. The goals of the proposed agency action establish the limits of reasonable alternatives. Congress established the Clean Coal Technology (CCT) Program with a specific purpose: to demonstrate the commercial viability of technologies that use coal in more environmentally benign ways than conventional coal technologies. Congress also directed DOE to pursue the goals of the legislation by means of partial funding (cost sharing) of projects owned and controlled by non-federal government sponsors. This statutory requirement places DOE in a much more limited role than if the federal government owned and operated the project. In the latter situation, DOE would be responsible for a comprehensive review of reasonable alternatives for siting the project. However, in dealing with an applicant, the scope of alternatives is necessarily more restricted because the agency must focus on alternative ways to accomplish its purpose that reflect both the application before it and the functions the agency plays in the decision process. It is appropriate in such cases for DOE to give substantial consideration to the applicant's needs in establishing a project's reasonable alternatives.

The range of reasonable alternatives to be considered in the EIS for the proposed Kentucky Pioneer IGCC Demonstration Project was determined in accordance with the overall NEPA strategy. The EIS includes an analysis of the No Action Alternative, as required under NEPA. KPE has stated that the site would be used to construct a natural gas-fired combined cycle plant should DOE decide against providing cost-shared funding for the gasification technology demonstration, and therefore, two No Action Alternatives will be addressed. No Action Alternative 1 assumes that DOE decides against providing cost-shared funding for the project and that no plant is constructed as a result. No Action Alternative 2 assumes that DOE decides against providing cost-shared funding for the project and that KPE constructs a natural gas-fired combined-cycle plant, the power island portion of the overall project without the gasification component, at the proposed project location. In addition, the EIS analyzes the Proposed Action, which includes engineering and design, permitting, fabrication and construction, testing, and demonstration of the gasification technology, and the operation of the power island on the generated syngas.

Because of DOE's limited role of providing cost-shared funding for the proposed Kentucky Pioneer IGCC Demonstration Project, the EIS does not evaluate alternative sites for the proposed project. Site selection was governed primarily by benefits that KPE could realize. KPE selected the proposed previously-disturbed project site because the costs would be much higher and the environmental impacts would likely be greater if an undisturbed area were chosen.

3.4.1 No Action Alternatives

The Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR Parts 1500-1508) and the DOE NEPA Regulations (10 CFR 1021) require the analysis of a No Action Alternative. Under the No Action Alternative, DOE would not provide partial funding for the design, construction, and operation of the Kentucky Pioneer IGCC Demonstration Project. This EIS considers two actions should this occur.

3.4.1.1 No Action Alternative 1

No Action Alternative 1 assumes that DOE decides against providing cost-shared funding for the project and that no plant is constructed as a result. This will result in no change in environmental impacts since it assumes that no plant would be built. DOE believes this scenario is unlikely to occur but it is presented because it serves as an analytical baseline for comparison of the environmental effects of the project.

3.4.1.2 No Action Alternative 2

No Action Alternative 2 assumes that DOE decides against providing cost-shared funding for the project and KPE constructs a natural gas-fired combined-cycle plant, the power island portion of the overall project, at the proposed project location. This alternative includes all associated facilities required for the operation of the power island, including administrative offices, on-site utilities, steam-generating units, required air emissions control equipment, wastewater treatment equipment, and the modification of the existing water intake structure. Siting for the foundation of the two combined cycle generator units would be within the 4.8-hectare (12-acre) plant site. All water for the plant would be supplied from existing EKPC intake structures at the J.K. Smith Site. The EKPC transmission line described in Section 3.1 would be required to support this action. The changes in the environment resulting from the operation of the power island are presented in the appropriate sections of Chapter 5, Environmental Impacts, and provide a basis for comparison with the impacts of the Proposed Action.

3.4.2 Proposed Action

Under the Proposed Action, DOE would provide, through a Cooperative Agreement with KPE, financial assistance for the design, construction, and operation of the proposed Kentucky Pioneer IGCC Demonstration Project. All associated facilities for the power and gasification islands, including fuel storage, rail car unloading sites, and air emissions control equipment, for the gasification technologies will also be constructed under the Proposed Action together with two syngas-fired combined cycle electric generation units and the transmission line. The proposed facility would be designed for at least 20 years of commercial operation and the CCT Program demonstration would operate for at least the first year. The proposed project would cost \$414 million, of which DOE's share would be approximately \$60 million, or 15 percent.

The proposed project includes the design, construction, and operation of the modified BGL gasification technology and associated facilities to provide a fuel source for the two planned turbines. Under the Proposed Action, the turbines would be fired using the syngas product generated by the gasification technology. The facility would demonstrate the following innovative technologies: (1) gasification of RDF pellets and coal; and (2) use of a syngas product as a clean fuel in combined cycle turbine generator sets. This project would be the first commercial-scale application of this modified co-feed version of the BGL gasification technology in the United States. The important modification to the BGL technology is the gasification of a blend of coal and RDF pellets. The demonstration would operate for at least the first year of the facility's 20-year commercial operational period. Data generated during the 1-year demonstration would be used to determine if the coal and RDF pellet co-feed would continue after the first year of operation.

The purpose of the proposed project is to generate technical, environmental and financial data from the design, construction, and operation of the facilities at a scale large enough to allow the power industry

to assess the potential of BGL gasification technologies for commercial application. If the project succeeds in generating this data, it would demonstrate that IGCC power plants, based on this technology, could be built cost effectively, with thermal efficiencies that would significantly reduce electric power costs over more conventional technologies.

3.5 Preferred Alternative

CEQ NEPA regulations require that an agency identify its preferred alternative, if one or more exists, in a Draft EIS and identify such an alternative in the Final EIS (40 CFR 1502.14 [e]). The preferred alternative is the alternative that DOE believes would fulfill its statutory missions and responsibilities giving consideration to economic, environmental, technical and other factors. This Kentucky Pioneer IGCC Demonstration Project Final EIS provides information on the potential environmental impacts. Cost, schedule, and technical analyses are also being prepared and will be considered in the DOE ROD.

DOE's preferred alternative (the Proposed Action) is to provide cost-shared funding to KPE through their Cooperative Agreement for the design and construction of the Kentucky Pioneer IGCC Demonstration Project under the CCT Program. The ROD will describe DOE's decision regarding whether to provide the \$60 million in cost-shared funding.

3.6 Comparison of Alternatives

Table 3.6-1 reflects a comparison of alternatives at the project site under the two No Action Alternatives and the Proposed Action. This brief comparison of impacts is presented to aid decisionmakers and the public in understanding the environmental impacts of proceeding with the Kentucky Pioneer IGCC Demonstration Project.

The following discussion is based on the detailed information presented in Chapter 5, Environmental Impacts. The environmental impact analyses were designed to produce a credible projection of the potential environmental impacts, using conservative assumptions and analytical approaches. A detailed discussion of the level of conservatism and any uncertainties in these analyses is presented in Chapter 5. Impacts presented are for each alternative alone and are not cumulative; however, comparisons of impacts for the different alternatives are made at points within Table 3.6-1.

Table 3.6-1. Comparison of Alternatives

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Land Use	<p>No new land disturbance would occur at the project site location.</p> <p>Mitigation: None anticipated.</p>	<p>Disturb approximately 121 hectares (300 acres) of previously disturbed land for project construction activities. The process area will occupy approximately 4.8 hectares (12 acres).</p> <p>No effects on surrounding land uses or local land use plans or policies are expected.</p> <p>Mitigation: None anticipated.</p>	<p>Disturb approximately 121 hectares (300 acres) of previously disturbed land for project construction activities. The process area and storage facilities will occupy approximately 7.6 hectares (19 acres).</p> <p>No effects on surrounding land uses or local land use plans or policies are expected.</p> <p>Mitigation: None anticipated.</p>
Socioeconomics	<p>No increase in new employment or workers would be expected. The employment and population in the region of influence (ROI) would remain the same.</p> <p>Mitigation: None anticipated.</p>	<p>Construction would generate approximately 120 jobs during the six-month construction phase with peak employment reaching 200 workers. Additional indirect employment of 138 to 230 jobs would be created based on the duration of peak construction levels.</p> <p>The 20-year operation period would require 24 workers and indirectly create an additional 54 jobs. There would likely be no change to the level of community services provided in the ROI.</p> <p>Mitigation: None anticipated.</p>	<p>Construction would generate approximately 600 jobs during the 30-month construction phase with peak employment reaching 1,000 workers. Additional indirect employment of 690 to 1,150 jobs would be created based on the duration of peak construction levels.</p> <p>The 20-year operation period would require 120 workers and indirectly create an additional 270 jobs. Population may increase in the ROI, but no impact is expected in the level of community services provided. <u>In areas near the plant, property values may decline slightly.</u></p> <p>Mitigation: None anticipated.</p>
Cultural Resources	<p>No impacts to cultural resources would occur at the project site location.</p> <p>Mitigation: None anticipated.</p>	<p><u>The Section 106 Review process for the Area of Potential Effect has been completed. The Kentucky State Historic Preservation Officer finds that there is not effect on historic properties.</u></p> <p>Mitigation: If resources are encountered during construction, procedures planned by Global Energy, Inc., would be followed upon discovery. Should any discoveries occur, the Kentucky State Historic Preservation Officer (SHPO) would be notified and construction in the area would cease until a qualified archaeologist could evaluate the findings and SHPO concurrence was obtained.</p>	<p><u>The Section 106 Review process for the Area of Potential Effect has been completed. The Kentucky State Historic Preservation Officer finds that there is not effect on historic properties.</u></p> <p>Mitigation: If resources are encountered during construction, procedures planned by Global Energy, Inc., would be followed upon discovery. Should any discoveries occur, the Kentucky State Historic Preservation Officer (SHPO) would be notified and construction in the area would cease until a qualified archaeologist could evaluate the findings and SHPO concurrence was obtained.</p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Aesthetic and Scenic Resources	<p>The existing project site location visual setting would not change, nor would area scenic resources be affected.</p> <p>Mitigation: None anticipated.</p>	<p>The combined cycle units would not be visible from outside of the site area. No visible plumes are associated with the combined cycle units. Fugitive dust during construction may temporarily affect visibility.</p> <p>Mitigation: Standard dust control measures would be implemented. Additional mitigation is not anticipated.</p>	<p>The combined cycle units would not be visible from outside of the site area. No visible plumes are associated with the combined cycle units. Fugitive dust during construction may temporarily affect visibility.</p> <p>The gasifier facility stacks and plumes would likely be visible from the City of Winchester, the community of Trapp, and the Pilot Knob State Nature Preservation. Fugitive dust during construction may affect visibility temporarily.</p> <p>Mitigation: Standard dust control measures would be implemented. Additional mitigation is not anticipated.</p>
Geology	<p>No impacts to geology or geologic resources would occur at the project site location.</p> <p>Mitigation: None anticipated.</p>	<p>Minor impacts on the geology and geologic resources due to disturbances associated with construction, parking, and construction laydown areas are expected, however, the site has been previously graded.</p> <p>Mitigation: Runoff and erosion controls, dust controls, and reuse of stockpiled soil.</p>	<p>Minor impacts on the geology and geologic resources due to disturbances associated with construction, parking, and construction laydown areas are expected, however, the site has been previously graded. Slightly greater impacts to prime farmland soils than No Action Alternative 2 are expected from the construction of additional support facilities.</p> <p>Mitigation: Runoff and erosion controls, dust controls, and reuse of stockpiled soil.</p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Air Resources	<p>No impacts to air resources would occur at the project site location.</p> <p>Mitigation: None anticipated.</p>	<p>Increases in annual air emissions of NO_x, SO_x, PM₁₀, and reactive organic gases (ROG) would result from the facility. The highest emissions would be in the form of NO_x (approximately 1,100 TPY), CO (approximately 800 TPY), and SO_x (approximately 500 TPY). The facility would also emit approximately 2.1 million TPY of CO₂. Pollutant emissions and levels would be well within applicable standards. No significant air quality impacts are expected from facility operation.</p> <p>Mitigation: Emission control equipment would be included in facility design.</p>	<p>Increases in annual air emissions of NO_x, SO_x, PM₁₀, and ROG would result from the facility. The highest emissions would be in the form of NO_x (approximately 1,100 TPY), CO (approximately 800 TPY), and SO_x (approximately 500 TPY). An increase in PM₁₀ emissions of approximately 15 percent over No Action Alternative 2 would occur. <u>NO_x and PM₁₀ would approach PSD Significant Impact level thresholds for annual average levels. PM₁₀ would also approach the 24-hour threshold.</u></p> <p>Hazardous air pollutant emissions would increase by 9.07 TPY. The facility would also emit approximately 2.1 million TPY of CO₂. Pollutant emissions and levels would be well within applicable standards. No significant air quality impacts are expected from facility operation.</p> <p>Mitigation: Emission control equipment would be included in facility design.</p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Water Resources	<p>No impacts to water resources would occur at the project site location. No activities would occur that could potentially affect wetlands and surface waters.</p> <p>Mitigation: None anticipated.</p>	<p>The facility would require 3.8 MLD (1 MGD) of surface water from the Kentucky River. Project operations would generate less than 1.5 MLD (0.4 MGD) of wastewater. Treated wastewater would be discharged to the Kentucky River in compliance with the site-specific Kentucky Pollutant Discharge Elimination System (KPDES) permit, resulting in negligible impacts. During 7-day low flow conditions, the facility would withdraw 1 percent of the flow of the Kentucky River.</p> <p>No use of or discharge into groundwater resources during construction or operation would occur.</p> <p>Mitigation: None anticipated beyond project design, including permit requirements, and administrative controls.</p>	<p>The facility would require a total of 15.1 MLD (4 MGD) of surface water from the Kentucky River. Project operations would generate 1.5 MLD (0.4 MGD) of process wastewater. Treated wastewater would be discharged to the Kentucky River in compliance with the site-specific KPDES permit, resulting in negligible impacts. The other 13.6 MLD (3.6 MGD) of <u>surface water</u> is used in the operation of the gasifier, turbine condenser, and fuel gas saturation process, as well as other miscellaneous uses. During 7-day low flow conditions, the facility would withdraw 1 percent of the flow of the Kentucky River. <u>In order to minimize potential conflicts over water availability during low flow conditions, the State of Kentucky limits permitted users to no more than 10 percent of the lowest average monthly flow. This requirement applies to EKPC's existing permit, which would likely be modified to incorporate the additional withdrawals associated with the Proposed Action.</u></p> <p>No use of or discharge into groundwater resources during construction or operation would occur.</p> <p>Mitigation: None anticipated beyond project design, including permit requirements, and administrative controls. <u>Although not a condition of the permit, during extremely low flow conditions for the Kentucky River, KPE has stated that it would work with the Division of Water and cease plant operations if requested.</u></p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Ecological Resources	<p>There is no potential to affect federally-listed plant and animal species, or species identified by other federal and/or state agencies at the project site location.</p> <p>Mitigation: None anticipated.</p>	<p>Since no federal- or State-listed protected, sensitive, rare, or unique species have been identified at the project site location, no impacts would be expected.</p> <p>In addition, the proposed site location does not contain suitable habitat for the federally endangered running buffalo clover. Approximately 4.8 hectares (12 acres) of old-field vegetation and habitat would be lost from construction of the proposed facility.</p> <p>Mitigation: Post-construction mitigation landscaping consisting of a control program for non-native invasive plants should be adopted.</p>	<p>Since no federal- or State-listed protected, sensitive, rare, or unique species have been identified at the project site location, no impacts would be expected.</p> <p>In addition, the proposed site location does not contain suitable habitat for the federally endangered running buffalo clover. Approximately 7.6 hectares (19 acres) of old-field vegetation and habitat would be lost from construction of the proposed facility and support structures.</p> <p>Mitigation: Post-construction mitigation landscaping consisting of a control program for non-native invasive plants should be adopted. <u>Due to the height of the emissions stacks, the Federal Aviation Administration will require stack lighting. To minimize bird strike mortality, the USFWS has developed a set of voluntary recommendations for tower siting, construction, operation, and decommissioning. The gasifier stacks lighting system would be designed in consideration of USFWS recommendations.</u></p>
Noise	<p>No noise impacts would occur since no construction activities would be taking place.</p> <p>Mitigation: None anticipated.</p>	<p>Short-term minor increase in noise during construction and operation.</p> <p>Vehicle traffic would cause minor noise increases over background levels in the community of Trapp.</p> <p>Mitigation: None anticipated.</p>	<p>Short-term minor increase in noise during construction and operation.</p> <p>Vehicle and rail traffic would cause minor noise increases over background levels in the community of Trapp.</p> <p>Mitigation: None anticipated.</p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Traffic and Transportation	<p>No adverse traffic or transportation impacts.</p> <p>Mitigation: None anticipated.</p>	<p>Increase in road traffic from construction and operation of facility. Depending on the level of construction activity occurring onsite, 100 to <u>200</u> vehicle trips per shift change would occur. Approximately 40 to 60 heavy duty truck trips per day would be made to and from the project site.</p> <p>Railcars would move heavy equipment to the site during construction as needed.</p> <p>Approximately <u>48</u> vehicle trips per day would be made during operation, all utilizing Kentucky Highway 89. No railcars would be required for operation.</p> <p>Mitigation: KPE should install turning lanes or traffic control devices (i.e., stop lights) at the intersection of Kentucky Highway 89 and the facility service road.</p>	<p>Increase in traffic associated with construction. Approximately 500 to <u>1,000</u> vehicle trips per shift change, depending on the level of construction occurring, and 40 to 60 heavy-duty truck trips per day would be made to and from the project site. <u>Traffic congestion may be heavy at times during afternoons when school buses operate along Kentucky Highway 89.</u></p> <p>Railcars would move heavy equipment to the site during construction as needed.</p> <p>Approximately 160 to 240 additional vehicle trips <u>throughout each</u> day would be made all utilizing Kentucky Highway 89 during operation.</p> <p>Approximately one unit train (100 rail cars) movement would be made in or out of site per day during facility operation. Existing rail infrastructure onsite is sufficient to accommodate a full unit train.</p> <p>Mitigation: Worker transportation options such as car pooling should be considered. KPE should install turning lanes or traffic control devices (i.e., stop lights) at the intersection of Kentucky Highway 89 and the facility service road. Implementation of directional controls for the service road should also be considered. <u>KPE agrees to repair roads damaged by facility truck traffic.</u></p>
Occupational and Public Health and Safety	<p>No occupational and public health and safety impacts.</p> <p>Mitigation: None anticipated.</p>	<p>Typical worker impacts present in the construction industry would be associated with facility construction.</p> <p>No significant occupational or public health and safety impacts are expected during facility operation.</p> <p>All noise and health impacts would be mitigated using typical industry safety measures.</p> <p>Mitigation: Typical industry safety measures would be implemented.</p>	<p>Typical worker impacts present in the construction industry would be associated with facility construction.</p> <p>No significant occupational or public health and safety impacts are expected during facility operation.</p> <p>All noise and health impacts would be mitigated using typical industry safety measures.</p> <p>Mitigation: Typical industry safety measures would be implemented.</p>

Discipline	No Action Alternative 1	No Action Alternative 2 (Power Island)	Proposed Action (Power and Gasification Islands)
Waste Management	<p>No change to existing facility services within the J.K. Smith Site.</p> <p>Mitigation: None anticipated.</p>	<p>Facility construction and operation would generate small quantities of hazardous and nonhazardous wastes and waste water.</p> <p>Mitigation: Typical industry measures would be implemented to minimize waste generation. Hazardous wastes would be disposed in approved hazardous waste landfills outside of Kentucky.</p>	<p>Facility construction would generate small quantities of hazardous and nonhazardous wastes and wastewater over the 30-month construction period.</p> <p>Operation would generate larger quantities of wastewater and hazardous wastes than No Action Alternative 2. The gasifiers would produce large quantities of vitrified frit and elemental sulfur, which <u>KPE expects</u> would be marketable.</p> <p>Mitigation: Typical industry measures would be implemented to minimize waste generation. Hazardous wastes would be disposed in approved hazardous waste landfills outside of Kentucky. Should the vitrified frit be shown to be hazardous, it would also be disposed in approved hazardous waste landfills.</p>

Note: MGD = million gallons per day; TPY = tons per year; MLD = million liters per day; USFWS=U.S. Fish and Wildlife Service.